

We claim:

- 1 1. A microfluidic method comprising:
2 delivering first and second fluids to a lumen of a microfluidic device such
3 that the first and second fluids flow adjacent to each other within the lumen
4 without mixing except for diffusion at an interface between the first and second
5 fluids, wherein the first fluid is different than the second fluid.

- 1 2. A microfluidic method according to claim 1 wherein the composition of at
2 least one of the first and second fluids varies over time as it is delivered to the
3 lumen so that the fluid forms a gradient with regard to a concentration of at least
4 one component of the fluid that changes along a length of the lumen.

- 1 3. A microfluidic method according to claim 1 wherein the microfluidic
2 device comprises a plurality of lumens, the method comprising delivering first and
3 second fluids to each of the plurality of lumens.

- 1 4. A microfluidic method according to claim 1 wherein the same first and
2 second fluids are delivered to each of the plurality of lumens.

- 1 5. A microfluidic method according to claim 1 wherein different first and
2 second fluids are delivered to the different lumens of the plurality of lumens.

- 1 6. A microfluidic method according to claim 1 wherein the lumen has a cross
2 sectional diameter of less than 2.5 mm.

- 1 7. A microfluidic method according to claim 1 wherein the lumen has a cross
2 sectional diameter of less than 1 mm.

- 1 8. A microfluidic method according to claim 1 wherein the lumen has a cross
2 sectional diameter of less than 500 microns.

- 1 9. A microfluidic method according to claim 1 wherein the first and second
2 fluids combine to form different crystallization conditions for crystallizing a
3 molecule.

1 10. A microfluidic method according to claim 1 wherein the first and second
2 fluids combine to form different crystallization conditions for crystallizing a
3 protein.

1 11. A microfluidic method according to claim 1 wherein the first and second
2 fluids combine to form different crystallization conditions for crystallizing a
3 macromolecule with a molecular weight of at least 500 Daltons.

1 12. A microfluidic method according to claim 1 wherein the first and second
2 fluids combine to form different crystallization conditions for crystallizing a
3 member selected from the group consisting of viruses, proteins, peptides,
4 nucleosides, nucleotides, ribonucleic acids, deoxyribonucleic acids.

1 13. The method according to claim 1 wherein the material to be crystallized
2 contains at least two or more materials selected from the group consisting of
3 viruses, proteins, peptides, nucleosides, nucleotides, ribonucleic acids,
4 deoxyribonucleic acids, small molecules, drugs, putative drugs, inorganic
5 compounds, metal salts, organometallic compounds and elements.

1 14. A microfluidic method according to claim 1 wherein the first and second
2 fluids have a same flow rate within the lumen.

1 15. A microfluidic method according to claim 1 wherein the first and second
2 fluids have a different flow rate within the lumen.

1 16. A microfluidic method comprising:
2 delivering first and second fluids to a lumen of a microfluidic device such
3 that the first and second fluids flow adjacent to each other within the lumen
4 without mixing except for diffusion at an interface between the first and second
5 fluids, wherein the first fluid is different than the second fluid and a composition of
6 at least one of the first and second fluids delivered to the lumen is varied so that the
7 composition of at least one of the first and second fluids within the lumen varies
8 along a length of the lumen.

- 1 17. A microfluidic method comprising:
 - 2 delivering first, second and third fluids to a lumen of a microfluidic device
 - 3 such that the first, second and third fluids flow adjacent to each other within the
 - 4 lumen without mixing except for diffusion at an interface between the first, second
 - 5 and third fluids, wherein the first, second and third fluids are different than each
 - 6 other and a composition of at least one of the first, second and third fluids
 - 7 delivered to the lumen is varied so that the composition of at least one of the first,
 - 8 second, and third fluids within the lumen varies along a length of the lumen.
- 1 18. A microfluidic method according to claim 17 wherein the composition of at
- 2 least one of the first, second and third fluids varies over time as it is delivered to
- 3 the lumen so that the fluid forms a gradient with regard to a concentration of at
- 4 least one component of the fluid that changes along a length of the lumen.
- 1 19. A microfluidic method according to claim 17 wherein the microfluidic
- 2 device comprises a plurality of lumens, the method comprising delivering first,
- 3 second and third fluids to each of the plurality of lumens.
- 1 20. A microfluidic method according to claim 17 wherein the same first,
- 2 second and third fluids are delivered to each of the plurality of lumens.
- 1 21. A microfluidic method according to claim 17 wherein different first,
- 2 second, and third fluids are delivered to the different lumens of the plurality of
- 3 lumens.
- 1 22. A microfluidic method according to claim 17 wherein the lumen has a cross
- 2 sectional diameter of less than 2.5 mm.
- 1 23. A microfluidic method according to claim 17 wherein the lumen has a cross
- 2 sectional diameter of less than 1 mm.
- 1 24. A microfluidic method according to claim 17 wherein the lumen has a cross
- 2 sectional diameter of less than 500 microns.

1 25. A microfluidic method according to claim 17 wherein at least one of the
2 first, second and third fluids have a different flow rate than another of the fluids
3 within the lumen.

1 26. A microfluidic method according to claim 17 wherein at least one of the
2 first, second and third fluids have a same flow rate than another of the fluids within
3 the lumen.

1 27. A microfluidic method according to claim 17 wherein the first, second and
2 third fluids combine to form different crystallization conditions.

1 28. A microfluidic method according to claim 17 wherein the first, second and
2 third fluids combine to form different crystallization conditions, the second fluid
3 comprising the material to be crystallized and being positioned between the first
4 and third fluids.

1 29. A microfluidic method according to claim 17 wherein the first, second and
2 third fluids combine to form different crystallization conditions for crystallizing a
3 molecule.

1 30. A microfluidic method according to claim 17 wherein the first, second and
2 third fluids combine to form different crystallization conditions for crystallizing a
3 protein.

1 31. A microfluidic method according to claim 17 wherein the first, second and
2 third fluids combine to form different crystallization conditions for crystallizing a
3 macromolecule with a molecular weight of at least 500 Daltons.

1 32. A microfluidic method according to claim 17 wherein the first, second and
2 third fluids combine to form different crystallization conditions for crystallizing a
3 member selected from the group consisting of viruses, proteins, peptides,
4 nucleosides, nucleotides, ribonucleic acids, deoxyribonucleic acids.

1 33. The method according to claim 17 wherein the material to be crystallized
2 contains at least two or more materials selected from the group consisting of
3 viruses, proteins, peptides, nucleosides, nucleotides, ribonucleic acids,

4 deoxyribonucleic acids, small molecules, drugs, putative drugs, inorganic
5 compounds, metal salts, organometallic compounds and elements.